PROCEEDINGS 53RD YEAR

JOURNAL

OF THE

AMERICAN WATER WORKS ASSOCIATION

VOLUME 27

1935

BALTIMORE, MD.
THE WAVERLY PRESS
1936

Engin.
Direct

TABLE OF CONTENTS

Limits of Pollution Loadings for Water Purification Systems. By H. W. Streeter 1

Trend of Public Utility Rates and Financing. By John H. Murdoch, Jr. 8

Report of the Committee on Water Works Practice for the Period from January 1, 1931 to July 1, 1934 13

Adjudication of Water Rights. By A. T. Rogers 37

Water Main Failures. By Arthur H. Miller 53

The Water Transmission of Infections, With Special Reference to Amebiasis. By Thomas B. Magath 63

Anchor or Frazil Ice at the Buffalo Intake. By Alan D. Drake 78

The Need for Master Meters and Recording Instruments. By Roland J. Leveque 83

Maintaining Carrying Capacity of Cast Iron Main by Introduction of Chloramines. By George C. Hodges and J. Walter Ackerman 86

Public Water Supplies in the United States and Population Served Thereby 91

Coagulation Control With a Recording Potentiometer. By Edward S. Hopkins 94

The Design and Operation of Swimming Pools. By J. H. Dorroh 100

A Solid Brilliant Green Lactose Bile Medium, for Direct Plating, With Results in Seventeen Hours. By Ralph E. Noble and Fred O. Tonney 108

Abstracts 121

The Effect of the Recent Drought on South Dakota Public Water Supplies. By E. G. Fiala 145

The Effect of the Drought on Public Water Supplies in Iowa. By A. H. Wieters 154

Public and Emergency Water Supplies During the Drought Period in Kansas. By Earnest Boyce 164

An Analysis of Unusual Precipitation Records in Iowa. By F. T. Mavis and J. W. Howe 174

Trends in Stream Pollution Research and Control. By J. K. Hoskins 191

Filter Sand Experiments. By L. F. Allan 205

Treatment of Water to Prevent Corrosion. By John R. Baylis 220

Effect of Road Oils and Tars on Public Water Supplies. By Lewis V. Carpenter, Earl W. Klinger and George R. Pyle 235

The Economic Feasibility of Municipal Water Softening in California. By Paul J. Beard and George C. White 248

Modern Devices for Improving Water Works Service. By L. A. Smith 264
Abstracts 268
Engineering Business Practice Relating to the Detroit Additional Water Supply Project. By Edward W. Frey 295
Problems of Water Works Superintendents. Some Equipment Used in Maintenance. By G. G. Routledge 313
Testing Domestic Water Meters for Low Rate of Flow and Its Effect on Revenue. By T. Hodkinson 315
Automatic Control of Deep Wells and Electricity in Thawing Frozen Water Pipes. By A. G. Peirson 319
Problems of Filtration Plant Operation. By G. H. Baker 323
The New Water Purification Plant for Springfield, Illinois. By Charles H. Spaulding and C. S. Timanus 327
The New Iron and Manganese Removal Plant for Lincoln, Nebraska. By D. L. Erickson 337
Recent Improvements in the Wheeling, West Virginia, Water System. By A. R. Todd 348
Recent Additions to the Sacramento Filtration Plant. By Carl M. Hoskinson 351
A National Water Policy. An Abstract of the Report of the Water Planning Committee of the National Resources Board. Abstracted by Martin E. Jansson 359
A Complete Installation of Supply and Distribution Mains With Asbestos-Cement Pipe. By C. A. McGinnis 373
Chloramine Treatment in Duluth. By Donald L. Johnson 382
Preparation of Reagents for the Albuminoid Nitrogen Determination. By I. A. Montank 386
Abstracts 389
Pressure Head in Perforated Pipes. By N. Malishevsky 413
Underground Corrosion in the Southeastern United States. By K. H. Logan 419
Nitrifying Bacteria in Water Supplies. By Douglas Feben 439
A Review of Elizabeth City's Struggle for an Acceptable Water Supply. By J. C. Parker 448
Operating Economies Effected Through Installation of Smaller Pumping Equipment. By E. R. Tull 454
Taste and Odor Control at Council Bluffs. By Wm. T. Bailey 458
Relief Program in Buffalo. By Francis J. Downing 472
Ground-Water Problems of the Coastal Plain. By O. E. Meinzer. 479
Water Waste Surveys and Distribution Systems Studies. By D. D. Gross 485
Color and Odor Removal at Ossining, New York. By Wallace T. Miller and James E. Kerslake 494
The Trend of Modern Taste and Odor Control. By F. E. Stuart 503
Stream-Gaging Activities in North Carolina During the Past Year. By E. D. Burchard 509

Menace of Soil Erosion. By J. H. Stallings..... 513
Proposed Gravity Water System for Wenatchee Valley, Washington. By Fred J. Sharkey..... 520
List of Section Papers. Indiana, New York, Canadian..... 530
Abstracts..... 532
Final Report of the Committee on Uniform Marking of Fire Hydrants..... 551
Uniform Marking of Fire Hydrants. By F. C. Jordan..... 553
The Spectrographic Determination of Minor Chemical Constituents in Various Water Supplies in the United States. By Mathew M. Braidech and F. H. Emery..... 557
Search for Underground Water in Perpetually Frozen Areas. By M. J. Chernyshoff..... 581
Hydrographic and Meteorological Surveys for Water Supply. By James E. Jones and George A. Lewis..... 594
Elimination of Pits and Subground-Level Pumprooms. By O. E. Brownell..... 600
Danger of Contamination of Water Supply When Water and Sewer Pipes are Close Together. By O. E. Brownell..... 606
Mechanical Cleaning of Water Mains at Evansville, Indiana. By Charles Streithof..... 610
Water Supply for Construction Camps. By Clayburn C. Elder..... 613
Corrosion from Zero Softened Waters. By Ray L. Derby..... 627
Practical Aspects of Coagulation With Ferric Chloride. By Charles Gilman Hyde..... 631
A Request for Information on Ground Water Replenishment..... 662
Erratum..... 664
Abstracts..... 665
The New Water Purification Works at Burnt Mills, Maryland. By Robert B. Morse..... 679
Design of Water Purification Plants at the South End of Lake Michigan. By Paul Hansen..... 692
Customer Inquiry Procedure. By John A. Bruhn..... 703
Indiana Rainfall and What is Ahead. By J. H. Armington..... 710
Disaster Preparedness. By Burt Harmon..... 719
The Emergency Treatment of Water Supplies Following Major Catastrophes. By R. F. Goudey..... 723
Laying Water Mains in Rock Formation. By F. G. Browne..... 730
Flushing of Water Mains. By C. E. Brown..... 735
Flushing of Water Mains. By C. G. R. Armstrong..... 739
Synura Troubles at Albany, N. Y. By George E. Willcomb..... 742
Low Water Troubles at Quincy, Illinois. By W. R. Gelston..... 749
Legal Aspects of a Large Artificial Lake Water Supply Project. By Clayton J. Barber..... 755
Water Works Records and Their Significance. By George B. Prindle..... 761
Report of A-21, Sectional Committee on Specifications for Cast Iron Pipe and Special Castings, Year 1934..... 767

Discussion. Spectrographic Determination of Minor Chemical Constituents in Water Supply. By E. S. Hopkins..... 772
List of Section Papers. Florida, Southeastern, Illinois, Montana, Pacific Northwest..... 775
Abstracts..... 778
Frontispiece. Frank A. Barbour, President, 1935–1936
The Chicago Stock Yards Fire, May 19, 1934. By Loran D. Gayton. 803
An Analytical Method of Determination of Leakage in Wood Stave Pipe. By A. A. Surin..... 812
New Filtration Plant at Albany, N. Y. By Ezra B. Whitman..... 822
Shortage of Public Water Supplies in the United States During 1934. By Gilbert F. White..... 841
New Water Softening Plant and Cleaning Existing Water Mains at Woodstock, Illinois. By John A. Fulkman..... 855
The Art of Planning as Related to Watershed Control. By M. W. Cowles..... 866
Sterilizing Velocities of Chlorine and Chloramine under Varying Conditions of Organic Load and pH. By Paul J. Beard and Nathaniel J. Kendall..... 876
Evaluation of Residual Chlorine. By A. E. Griffin..... 888
Aeration of Water by Air Diffusion. By Frank C. Roe..... 897
A Planned Future for the Distribution System. By C. R. Bird... 905
The State's Interest in Our Water Resources. By W. H. Frazier.. 912
Abstracts..... 918

The Cincinnati Convention, May 6 to 10, 1935

Part 1. Main Session

The Drought of 1930–34 in Kansas. By Earnest Boyce..... 941
The Effect of the 1934 Drought on Ohio Public Water Supplies. By W. H. Knox..... 946
On Water Planning for the Nation. By Morris Llewellyn Cooke.. 949
Deficiencies in Present Water Resources Information. By Thorndike Saville..... 964
Discussion. By F. A. Barbour and Abel Wolman..... 977
The Municipal Water Supply of Paris. By John B. Hawley..... 983
Some Engineering Features of the Enlargement of the O'Shaughnessy Dam. By Leslie W. Stocker..... 986
Design and Construction of the Morris Dam for the City of Pasadena. By Samuel B. Morris..... 993
The Bouquet Canyon Dam and Inlet-Outlet Pipe. By W. W. Hurlbut..... 1017
Current Situation in the Public Works Program. By Malcolm Pirnie..... 1030
Future Growth of American Cities. By C. A. Dykstra..... 1041
Economic Security. By Henry M. Waite..... 1049
Reconditioning Water Supply Lines With Bituminous Enamel. By Linden Stuart..... 1055

Cement Lining of Large Diameter Mains in Place by a Centrifugal Machine. By Elson T. Killam 1065
Applying Cement Mortar Lining to Existing Mains in England. By Thomas H. Wiggin 1073
Abstracts 1082

Part 2. Water Purification Division

Determining the Bacteriological Quality of Drinking Water. By J. K. Hoskins and C. T. Butterfield 1101
Limiting Standards of Bacterial Quality for Sources of Purified Water Supplies. By H. W. Streeter 1110
Results of Algal Activity, Some Familiar, Others Obscure. By W. C. Purdy 1120
Study of Selective Media for Coli-Aerogenes Isolation. By C. C. Ruchhoft and John F. Norton 1134
The Relative Productivity of Certain Culture Media. By R. E. Noble 1143
The Preparation of Fine Anthracite Coal for Use in Filter Plants. By E. L. Buller 1161
A Colorimetric Method for the Determination of Dissolved Oxygen. By F. Wellington Gilcreas 1166
Progress Report of Committee on Tentative Methods for Testing Zeolites 1178
Acid Mine Drainage Control on Upper Ohio River Tributaries. By E. S. Tisdale and E. W. Lyon 1186
Effect of Excess Lime Hydrate upon Corrosive Soft Water. By Frank E. Hale 1199
Chemical Hazards in Water Works Plants. Chlorine. A Committee Report 1225
Report of Joint Editorial Committee, Standard Methods for the Examination of Water and Sewage 1249
Abstracts 1253

Part 3. Finance and Accounting Division

A Suggested Water Works Collection Procedure. By M. F. Hoffman 1273
The Financial History and Present Financial Policy of the Water Department of Cincinnati, Ohio. By A. S. Hibbs 1278
Sales Taxes in Relation to Water Utilities. By Dale L. Maffitt 1284
Recording Physical Property Data. By Charles Haydock 1290
The Collection of National Water Works Data. By Nathan B. Jacobs and John W. Guilday 1297
Relation of Engineering and Accounting to the Item of Depreciation for Ratemaking and for Taxes. By E. E. Bankson 1307
Should Municipal Plants be Regulated by Utility Commissions and be Subject to Taxation? By Joseph A. Beck 1323
Accounting Uniformity. By Harry Boggs 1331
A Review of the Special Lien Bond Situation. By Robert A. Taft. 1343

Plant Management and Operation Division

Preventing the Theft of Water. By C. M. McCord..... 1357
Stub Billing. By T. G. Banks..... 1360
Storage Yard and Material Handling. By W. V. Weir..... 1363
Painting, Markings and Other Characteristics of Fire Hydrants. By Thomas L. Amiss..... 1366
Is a Record System of Underground Water Mains Justifiable? By E. A. Munyan..... 1372
Progress in Dams and Pipe Lines. By Thomas H. Wiggin..... 1386

General

Report of Committee on Licensing of Water Works Employees... 1392
Report of Sectional Committee A-21 on Specifications for Cast-Iron Pipe..... 1406
Report of the Secretary, 1934..... 1410
List of Section Papers. Central States, Rocky Mountain..... 1413
Society Affairs. The Annual Convention..... 1415
Abstracts..... 1424
Water Rights of Successors to Mexican Pueblos in California. By W. G. Irving..... 1449
Operation of the Athens Water Supply. By R. W. Gausmann..... 1458
Ammonia Dosage in Ammonia-Chlorine Treatment of Water. By M. L. Koshkin..... 1477
Accomplishments in the State Supervision of Dams. By George W. Hawley..... 1492
Handling of Delinquent Accounts. By C. E. Thatcher..... 1504
The Lives of Water Works Structures. By G. A. Elliott..... 1509
Experience With Fluorine in Water. By Jane H. Rider..... 1516
Effect of Meter Modernization in Germany. By H. W. Niemeyer. 1525
Municipal Ground Water Supplies in Ontario. By W. B. Redfern. 1533
Filter Washing Experiments at the Chicago Experimental Filtration Plant. By Herbert E. Hudson, Jr..... 1547
Pipe Cleaning. By Charles Haydock..... 1566
Coagulating the Water of the Delaware River at Easton, Pennsylvania. By R. W. Haywood, Jr..... 1572
Report of Committee on Electrolysis and Electrical Interference. 1581
Report of Committee on District Meetings of the Indiana Section. 1589
Typhoid Fever in the Large Cities of the United States in 1934.. 1593
Standard Specifications for Riveted Steel Elevated Tanks and Standpipes..... 1606
List of Section Papers. Southwest..... 1626
Abstracts..... 1628
Emergency Work of the Division of Sanitation During the New York State Flood. By Anselmo F. Dappert..... 1647
The Coast Range Tunnel of the Hetch Hetchy Aqueduct. By Leslie W. Stocker..... 1670
Weed Growths in Reservoirs and Open Canals. By G. E. Arnold.. 1684

Concrete Coating for Pipe and the Wilson Machine. By Sterling C. Lines 1694
The Municipal Water Supply of Paris. By John B. Hawley 1699
The Municipal Water Softening Plant at Glendive, Montana. By C. W. Eyer 1704
Lewiston's Water System. By W. P. Hughes 1708
The Determination of Sodium Chloride in Salt. By C. W. Foulk and John R. Caldwell 1712
Interference of Algae With Tests for Residual Chlorine. By E. W. Johnston and W. R. Edmonds 1717
Problems in Water Filtration Plant Operation:
Brantford, Ontario. By F. P. Adams 1725
Hamilton, Ontario. By D. H. Matheson 1727
Peterborough, Ontario. By William G. Hunt 1728
Comparative Studies of Media for the Determination of the Coli-Aerogenes Group in Water Analysis. By C. C. Ruchhoft. 1732
Report of the Committee on Water Works Practice for the Year Ending July 1, 1935 1746
List of Section Papers. New York, Minnesota, New Jersey, California, North Carolina, Wisconsin 1770
Abstracts 1773